

Building a Low Carbon Society

First Draft

Ministry of the Environment, Japan

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About this paper

- In May 2007, Japanese Government has identified building Low-Carbon Society and promoting Innovative Technology Development as two keys to make global emission half in 2050.
http://www.kantei.go.jp/foreign/abespeech/2007/05/24speech_e.html
- Ministry of the Environment, Japan has started to develop ideas on Low-Carbon Society's principles, images and strategies to realize, mainly for Japan. With regard to this work, we don't be based on numerical scenarios, instead, we try to describe broad direction toward Low-Carbon Society.
Please refer to a research program, "Japan Low-Carbon Society Scenarios toward 2050" for numerical scenarios.
<http://2050.nies.go.jp/index.html>
- Images and strategies for Low-Carbon Society should be diverse among countries, depending on their natural environment, developing stages, industrial structures. But we believe elements Japan describes will be useful for other countries and we would like to work together for further development of ideas with international colleagues.
- This paper is not our conclusion but the starting point and material for discussion.
We very much welcome comments from all over the world.

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Ministry of the Environment, Japan

Building a low carbon society

1. Principles

- 1) **Carbon Minimization in all sectors**
Minimization of carbon-dioxide emissions from all sectors
- 2) **Toward a Simpler life style that realize richer quality of life**
Shifting from mass-consumption society towards QOL oriented society. Revolution led by consumers' choice. "Mottainai" spirit.
- 3) **Coexistence with Nature**
Maintaining and restoring natural environment that is essential for human society

2. Images

- 1) **Mobility**
Public transportation plays a central role. Intelligent transportation system and efficient cars will be used.
- 2) **Living & Working Scene**
Highly insulated houses / buildings and efficient appliances are widespread
- 3) **Industry**
Low carbon energy supply and production technologies are developed and used
- 4) **Consumers' choice**
Carbon minimum choices will become common by widespread "visualization" technologies and changes in consumer consciousness
- 5) **Forests & Agricultures**
Contribute as carbon sink, energy sources & QOL
- 6) **Aspects from Areas(Urban & Rural)**
Compact cities will be formed depending on the scale of the cities

3. Strategies to realize a Low-Carbon Society

Barriers

- **Technical**
- **Economical**
- **Social**
- **Informational**

Innovations

- Energy technologies
- Social systems
- Lifestyle etc.

Desirable actions for citizens

Desirable actions for companies

Policy instrument of the government

- 1) **Institutional infrastructures**
Incentives (Prizes, regulations, economic instruments)
- 2) **"Soft"-infrastructures**
Human resources (capacity building, education), information (visualization), financial resources
- 3) **"Hard"-infrastructures**
Urban structure, buildings, transportation network, energy supply, adaptation
- 4) **Natural capitals**
Sink, biomass resources, adaptation

Development of low carbon infrastructures

4. Sharing experiences and ideas among countries & International cooperation

1. Principles for a Low-Carbon Society

1. Principles for a Low-Carbon Society

All the world's countries need to unite to make supreme efforts to establish a low-carbon society by “reducing global emissions by half from the current level by 2050.” For example, if CO₂ emissions per capita were the same worldwide when the 50% reduction is realized, the developed countries would need to reduce its per capita emissions by 70 to 80 % from the current level, and the developing countries would need to keep approximately the current level while achieving economic growth and improved quality of life. Such a society cannot be realized if the current trends continue. All countries, organizations, and entities have to take action based on the following philosophies.

1) Carbon Minimization in all sectors

“A low carbon society” in the ultimate sense would be a society that emits greenhouse gases only in an amount which can be absorbed by nature (Carbon Neutral Society). To achieve this goal, we have to have a social system that all sectors, such as industries, governments, and citizens, will naturally or automatically give special consideration to their selection and decisions in order to minimize carbon-dioxide emissions (carbon minimization).

2) Toward a Simpler life style that realize richer quality of life

People would need to forgo the mass-consumption society, mainly formed by developed countries, and build a new society in which value is placed on family or community ties, health, interactions with mother nature and “Mottainai” spirit to improve the quality of life. This type of consumer choice would lead to a revolution in the social system, moving toward a low-carbon, rich society.

3) Coexistence with Nature

We recognize human and its society is a part of global ecosystem. In order to secure the CO₂ absorption essential for a low-carbon society and to adapt to the unavoidable global warming, it is important to maintain and restore rich, diverse natural environments, such as forests. To achieve this symbiosis, local communities should place importance on harmony and coexistence with nature, and promote “nature-friendly technologies,” such as utilization of biomass.

Principles for a Low-Carbon Society

Carbon
Minimized

Minimization of carbon-dioxide emissions from all sectors

Simpler & Richer
Quality of life

Shifting from mass-consumption society towards QOL oriented society. Revolution led by consumer' choice. “Mottainai” spirit.

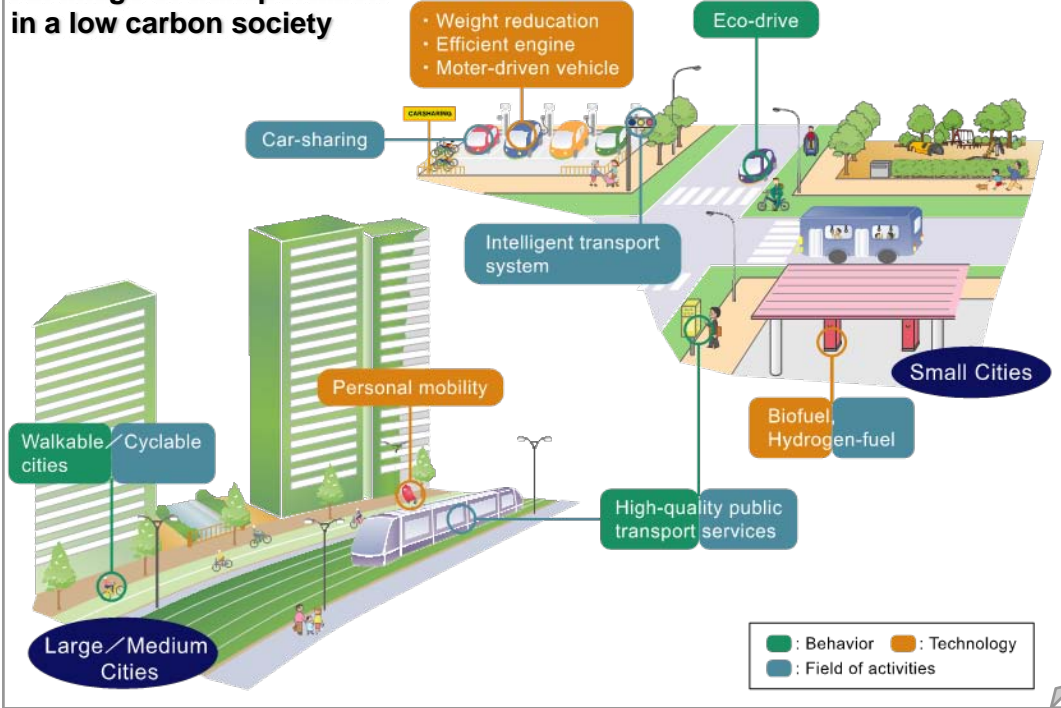
Coexistence
with Nature

Maintaining and restoring natural environment that is essential for Low-Carbon Society

2. Images of a Low-Carbon Society

01 Mobility

An image of transportation in a low carbon society



Behavior

- Environmentally friendly transportation will be chosen by the people. People's choice would be assisted with information such as CO2 emissions of each transportation means ("visualization" technology) or traffic information on public transportation (intelligent transportation system), as they become readily available.
- Local residents will actively participate in the development of the community.

Technology

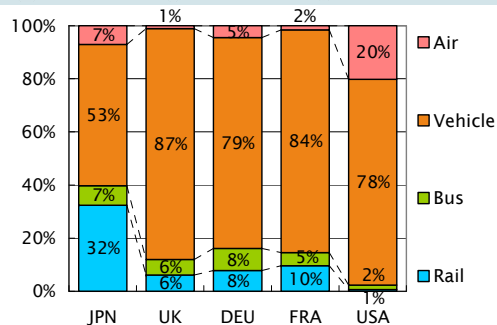
- The efficiency of individual cars due to lighter bodies and widespread use of motor-driven cars (plug-in hybrid cars, electric cars, fuel-cell cars) will increase substantially. Air pollution caused by cars will have been overcome.
- Many personal (single-seat) vehicles will be introduced. The choice of transportation means will be broadened considerably.
- Autonomous travel will be allowed by an intelligent transportation system. Traffic accidents will be reduced to almost zero.

Field of activities

- Public Transportation services, such as railways, buses, monorails, and LRTs, depending on the scale of the city, will be selected or combined.
- Physical distribution system will be sophisticatedly managed by advanced ICT (Information & Communication Technologies), and appropriate mode of transportation, such as railways, ships, and trucks are selected. With those systems, low carbon distribution systems are formed.
- A compact town convenient for pedestrians and cyclists will be formed (e.g., formation of a transit mall around a public transportation station).
- Car sharing systems will be widely introduced. People rent an appropriate size of vehicle when needed.
- Intelligent transportation systems will not only collect and provide traffic information, but they will also enable an advanced billing method, thereby forming the basis of a low-carbon transportation system.

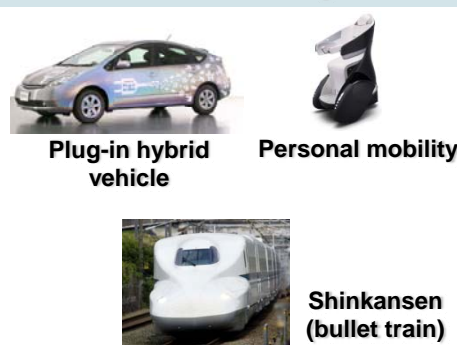
Pride of Japan

High share of public transportation



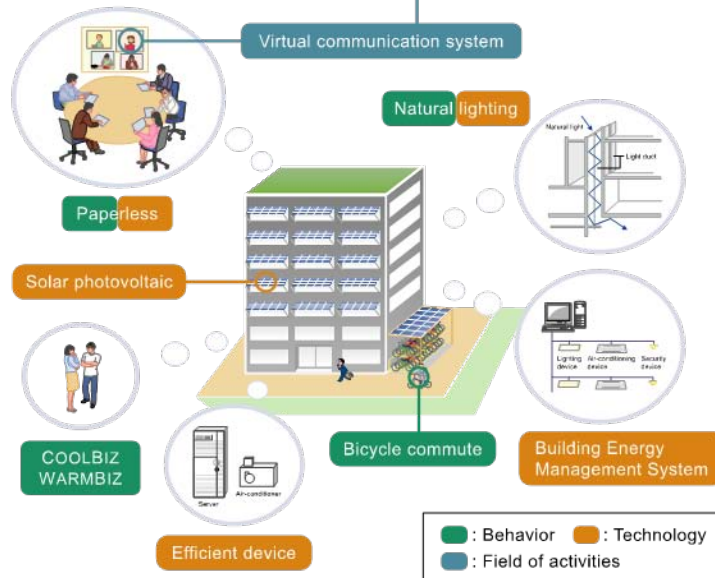
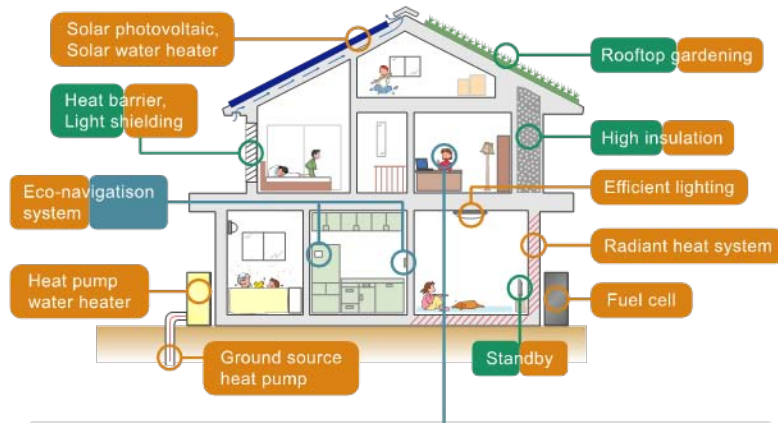
Share of transportation volume by mode in developed countries
JPN: 2003, UK, GER, FRA: 2002, USA: 2001 (Ref. MLIT)

Excellent vehicle technologies



02 Living and Working Scene (Houses & Buildings)

An image of living scene in a Low-Carbon Society



An image of working scene in Low-Carbon Society

Note: Fluorocarbons will not be used in air-conditioner, insulations, and heat pumps

Behavior

- It would become a common practice to avoid wasting energy and to efficiently use natural energies at homes and offices.
- Energy will be conserved based on accurate information provided by “visualization” technology.
- Energy will also be conserved by cooperation among members of families, residents of apartments, and employees of companies that possess environmental sensitivity and always consider how to avoid wasting energy.
- With the great support of advanced ICT, people would be able to choose their working style freely no matter where they live since working environment in their house or nearby facilities would be as good as in the office. The technologies also offer great flexibility to the companies, and allow companies to start worldwide business without having office in the big city.

Technology

- Energy-efficient devices and natural energy-based devices will be developed by Japanese “monozukuri (manufacturing)” technologies, and are widespread.
- Control technology using ICT will be widespread. Lighting and air-conditioning will be operated in association with the movement of people.
- Architects and builders who create houses suitable for local weather conditions will be fostered to provide and spread the use of comfortable buildings in which natural materials are used and heating is less required in the wintertime.
- Construction methods & designs and renovation to lengthen the life of housing (200 years houses) will be widespread. The resale housing market will be revitalized.
- Wooden houses and other buildings would become more popular. Use of wood will be introduced to mid-story constructions as well.

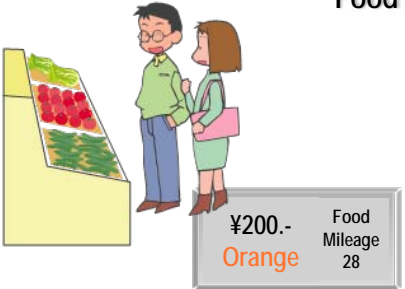
Field of activities

- An infrastructure will be developed for “visualization” where CO2 emissions of individual devices can be recognized (display of the environmental load and advice about environment-conscious behavior).

03 Consumers' Choice


An image of consumers' choice and
"visualization" in a Low-Carbon Society

Food



Emissions are displayed on price display panels and barcodes on items. Preference for seasonal and local ingredients

Houses



GHG emissions during construction or use will be indicated for each house. The value would provide an important reference for choice of a house. People would move into houses with sizes suitable for their life stage.


Rent	
Rent	¥
Utilities	¥
CO2	kg
Wood	
..	

Home appliances

メーカーまたはブランド	製品名称	省エネラベルが記載された製品			
		省エネ性 マーク	省エネ基準達成率	冷暖房平均 効率(COP)	APE
1	三菱電機 霧ヶ峰 ムーブアイ	🌱	106	5.60	6.0
2	富士通ゼネラル	🌱	104	5.81	5.9
3	シャープ (冷暖房) 搭載エコナ	🌱	100	5.15	5.8
4	富士通ゼネラル	🌱	100	5.41	5.8
5	シャープ (冷暖房) 搭載エコナ	🌱	96	5.15	5.6
6	三洋電機	🌱	93	4.90	5.4

GHG emissions for each product throughout its lifecycle will be quantified and indicated. This value would provide an important reference for choosing a product

Leisure activities



When a leisure activity having large GHG emissions (overseas trip, etc.) is chosen, a corresponding carbon offset will be purchased.


Behavior

- These behaviors would become common practice when they purchase goods:
 - do not receive unnecessary accessories or wrapping;
 - prefer to purchase reuse products or to purchase services rather than products (rental);
 - prefer goods that have a low environmental load in terms of lifecycle;
 - Feel proud to their hometown and prefer to purchase locally produced goods
 - do not purchase goods from companies that are not sensible of Corporate Responsibility; and
 - pay counter value (price) for use of the Earth's limited resources (greenhouse gas emissions)

Technology Field of activities

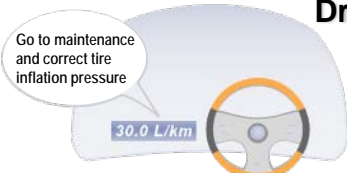
- An infrastructure will be developed for "visualization" where CO2 emissions of individual devices can be recognized (display of the environmental load and advice about environment-conscious behavior).
- "Eco-points" system, in which the points are awarded for environmentally friendly behavior or for purchasing environmentally friendly goods and services, will be widely introduced

Cars



A car with an appropriate size will be rented only when needed.

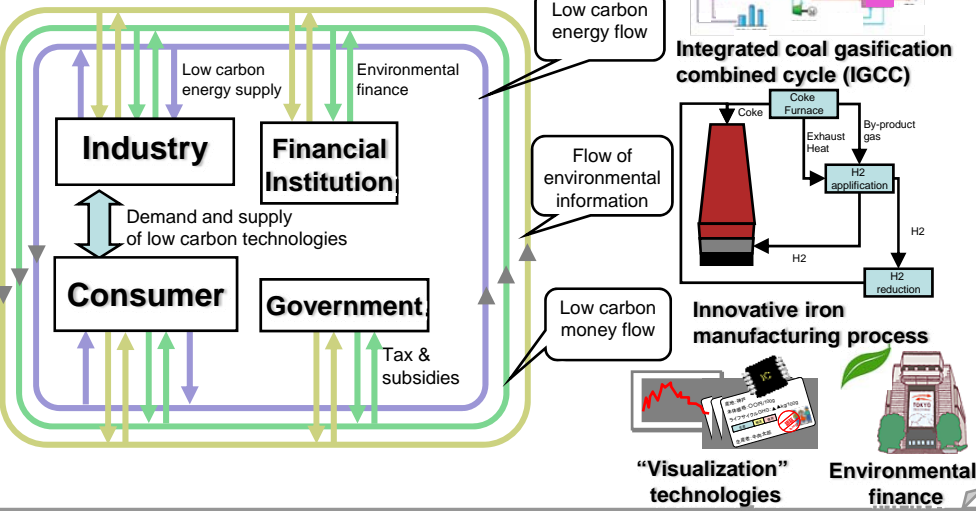
Drive



Fuel consumption and advices on eco-driving will be displayed or guided. People would put the advices on eco-driving into practice

04 Industry

Flows of Money, technologies, information underlying Low-Carbon manufacturing



Behavior

- Global warming will be considered as a new business opportunity. Companies would be actively tackling this issue and contributing to building a low carbon society through technology development, efficient production process, promoting use of recyclable resources on the basis of LCA consideration, employee training and technology transfer to developing countries
- Detailed information about their corporate activities for environmental loads and environmental issues will be disclosed to the public.
- Business models would be innovated continuously so that corporate activities would not be hindered in a Low-Carbon Society.
- Flexible work styles will be offered in terms of work hours, location, second jobs, etc. Employees can have enough time for community services.
- CO₂ emissions would be minimized from a view point of whole supply-chain.

Technology

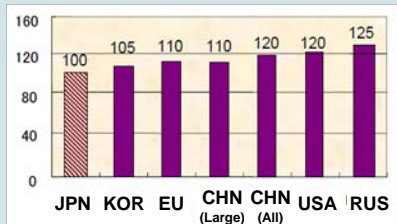
- High energy-efficient end-use technologies and natural energy technologies will be developed by the concentration of Japanese "monozukuri (manufacturing)" technologies, and these will become widespread in consumer sectors.
- Innovative manufacturing techniques, such as iron (steel) making techniques using hydrogen instead of coal as a reducing agent, will be developed and introduced into manufacturing processes, resulting in a large contribution to a reduction in CO₂ emissions by the industrial sector.
- Low-carbon power generation will be realized by developing and popularizing highly efficient zero-emission thermal power generation, advanced atomic power generation, renewable energy, highly efficient electric power transmission, etc.

Field of activities

- There will be a structure established, in which finance is provided for companies having excellent environmental technologies as well as research and development projects of innovative environmental technologies. There will be a variety of environmentally friendly financial products.
- Support systems for the worldwide deployment of technologies capable of reducing the greenhouse effect will be established.

Pride of Japan

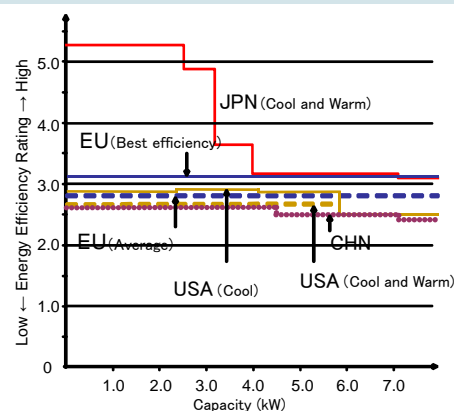
Japan has many "Best available technology"



Comparison of energy index for manufacturing 1 ton of iron



Hybrid vehicle



Energy Efficiency Rating of Air Conditioners

Sources: ECCJ

05 Forests and Agricultures

Goods and services provided from
Low-Carbon forests and agricultures

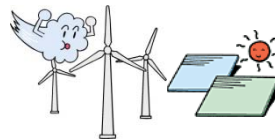
Forests

Wood production
according to increasing
wooden buildings

Cherish nature

Cellulosic bioethanol
Production from rice straw
and thinned timber

Carbon sink

"Identifiable" production
of primary commoditiesEnergy production
In the fallow land

Agricultures

Behavior

- Safe primary commodities will be supplied by a variety of production and consumption activities based on local climates and features with producers and consumers being "identifiable."
- Learning places will be provided where urban citizens cherish nature, including an increase in travelers taking long-stay vacations.

Technology

- Vitality of primary commodities will be enhanced by the increased scale of farm management and efficient production. Food and wood self-sufficiency will be improved. Forests will be maintained as a carbon sink.
- Fallow land would be used as an energy producing area (energy crops, solar power stations, and wind farms).
- Technology for producing bioethanol from cellulosic materials, such as rice straw and thinned timber, will become widespread.
- State-of-the-art monitoring technology will also contribute to the maintenance and management of forests.

Field of activities

- There will be a development of rules and infrastructures that allow people to know where and how any primary commodity was produced.
- Local landscape, including forests, rural scenes, mountains, and seaside will be more valued. People will enjoy rich ecological services from well maintained nature. Rural culture will be inherited.

06 Aspects from Areas (Urban and Rural)

Large/Medium cities

- People and capital will be highly concentrated, and high-value-added service businesses will be established.
- Roads will be designed so that bicycles and personal vehicles can travel safely.
- A public transportation network will combine railway, LRT, and bus services depending on the scale of the city.
- The ratio of apartments will become very high. Workplaces will be close to home.
- Central places of towns will be equipped with heat transport pipes so that exhaust heat will be used effectively.
- Heat Island is mitigated by well designed urban structure with "wind channel", open space, and waterside.

Small cities

- Commercial facilities and houses will be concentrated in a compact area around, for example, a railway station.
- Advances in ICT will improve the convenience of busses. The bus services play important role as a public transportation, and appropriate size of the busses are chosen depending on the demand
- Agricultural land will be located around a city, so that local farm products can be readily consumed locally.
- The ratio of wooden buildings will increase for medium-rise buildings, which are conventionally made of steel frames.

Rural area

- Primary industries will be revitalized by enlarging the scale of farm management and efficient production.
- The ratio of cars will still be high as a means of transportation; however, cars will be driven by a motor or use biofuel.
- Most housing and buildings will be made of wood.
- Resources for bioenergy will include thinned timber from forests, as well as energy crops and agricultural waste from agricultural land.
- Advances in communication systems will allow people to work in a nature rich area. People will also be able to enjoy medical and educational services regardless of living place.

An image of urban and rural areas in a low carbon society



City size and components of a low carbon society

	Large/medium cities	Small cities	Rural area
Trans- por-tation	Walk, bike		
	Personal mobility		
	Railway, LRT		
	Bus		
Buildings	Vehicle (motor driven, bio fueled)		
	High-rise housing and building		
	Medium-rise housing and building (steel frames)		
	Medium-rise housing and building (Woods)		
Energy	Low-rise housing and building (Woods)		
	Solar photovoltaic, heating		
	Heat transport		
	Wind		
	Bioenergy supply		

The rough classification of Low-rise, Medium-rise, and high-rise buildings are 2-3 stories, 4-7 stories, and more than 7 stories respectively.

3. Strategy for Building a Low-Carbon Society

3. Strategy for Building a Low-Carbon Society <1/4>

Citizens and corporations are expected to proactively take action to contribute to the creation of a low-carbon society. The government is responsible for establishing systems and rules, and for providing the social capital to ensure that these citizen and corporate actions can be taken in a smooth and sustainable way.

Desirable actions for **Citizens**

- “Eco-participation,” “eco-thinking,” and “eco-sharing”
- Practice “eco-learning,” “eco-buying,” “eco-use,” and “eco-disposal.”

Desirable actions for **Corporations**

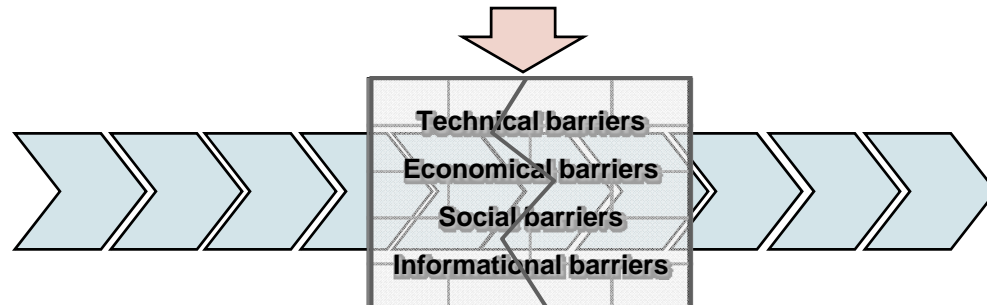
- Development of low-carbon-oriented products and promotion of technological innovations on a global level
- Creation of new business models
- Promotion of disclosure of environmental information
- Development of various environmentally friendly financial products

Policy instruments by the **Government**

Infrastructure development towards a low carbon society should be started at an early point by considering that time needed for development of institutions, human resources, consumer durable goods, buildings, and urban infrastructures are different

- Institutional infrastructures
- “Soft”- infrastructures
- “Hard”-infrastructures
- Natural capitals

Today



Low-Carbon
Society

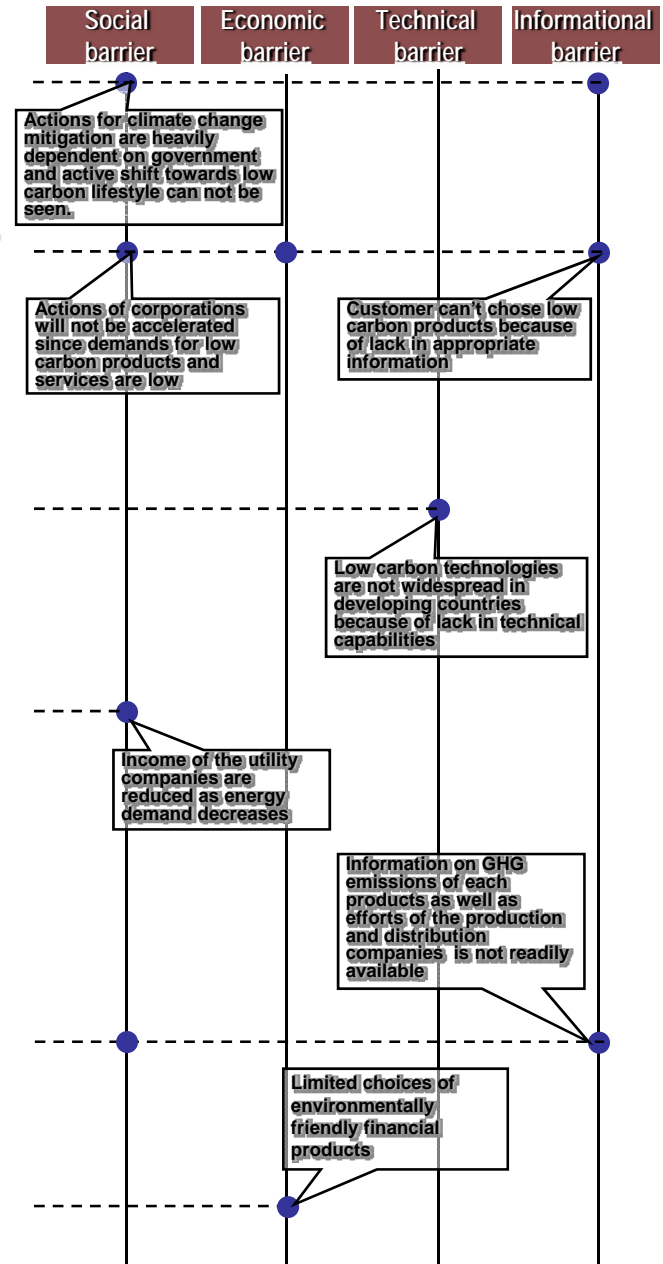
Desirable actions for Citizens

- **"Eco-participation," "eco-thinking," and "eco-sharing"**
Citizens are encouraged to be actively involved in the creation of a low-carbon society based on the consciousness that human beings are a part of ecosystem and are also main actors to create coexistence society, as well as to offer a variety of ideas to reduce carbon emissions and communicate and share these ideas.
- **Practice "eco-learning," "eco-buying," "eco-use," and "eco-disposal."**
Citizens need to follow an environmentally friendly lifestyle where they have accurate knowledge of the global warming issue and respect for nature, as well as other people, and assume responsibility for the next generation. Citizens also pay for use of the Earth's limited resources such as GHG emission through carbon offset system

Desirable actions for Corporations

- **Development of low-carbon-oriented products and the promotion of technological innovations on a global level**
Japanese corporations should take full advantage of their "monozukuri (manufacturing)" capabilities, develop technologies contributing to the creation of a low-carbon society, apply them across the world and promote technological innovation on a global level.
- **Creation of new business models**
Corporations need to pursue the creation of new business models – free from convention – that contribute to the creation of a low-carbon society and achieve income growth in this type of society, as well as innovate by themselves to challenge new business areas.
Examples of a "low-carbon business model"
Low-carbon architect: Architecture that receives compensation based on GHS reductions achieved through architectural design.
Energy service company: Shift from the business of selling energy to the business of selling energy-related services
Promote the growth of leasing and rental companies
- **Implementation of the disclosure of environmental information**
Corporations are encouraged, in an easily accessible way, to disclose detailed information on their response to environmental loads and environmental problems associated with their corporate activities.
- **Development of various environmentally friendly financial products**
Financial institutions need to develop various environmentally friendly financial products and provide sufficient finance to innovative R&D activities for environmental technologies and corporations that excel at environmental technology.

*Words balloon indicates examples of current barriers



Policy instruments by the Government

*Words balloon indicates examples of current barriers

Institutional infrastructure (Provision of incentives)

Promotional approach:

- Establishment of awards to recognize people who take approaches to promote a low-carbon society, as well as follow a low-carbon lifestyle, develop low-carbon-oriented products and foster local governments that contribute to the development of low-carbon towns. This includes support for the publicity and application of these model cases across the world.
- Promotion of environmentally friendly contract.

Economic approach:

- Formulation of rules to internalize costs of carbon emission to economic system (ex. Carbon tax / emission trading scheme). Commercialization of carbon reduction investment.
- Establishment of an economic mechanism to maximize the use of renewable energy.
- Green tax reform (ex. Tax incentives for environmentally friendly products and investments)

Regulatory approach:

- Wider application of regulations based on the best available technology.

“Soft”-infrastructure

Human development:

“Promotion of eco-learning”

- Compulsory education on environmental issues at schools, corporations and driver’s training schools.
- Creation of opportunities to have education on recycling society
- Creation of opportunities for people to commune with nature through the promotion of communications between urban and rural residents

“Promotion of the transfer of conventional “monozukuri (manufacturing)” technologies to the next generation”

- Establishment of a system to transfer low-carbon-oriented manufacturing technologies to the next generation
- Improvement in a system to learn manufacturing technologies by e-learning

“Human development for further innovations

- Establishment of an international network to study a low-carbon society
- Human development in undergraduate/graduate courses for individuals who are dedicated to building a low carbon society over their career

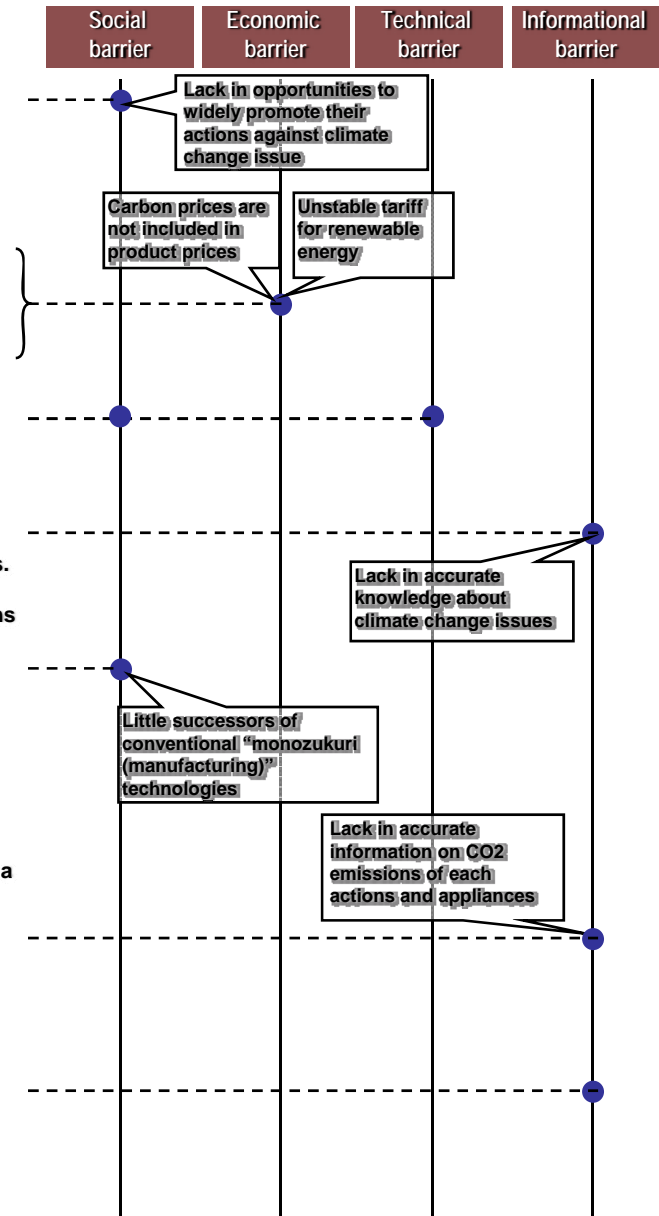
Information Sharing:

“Large-scale circulation of high-quality environmental information”

- Development and dissemination of “visibility” technology on green house gases.
- Promotion of carbon disclosure (disclosure of environmental information associated with corporate activities).
- Establishment of international center for collecting information on a low-carbon society.

“Creation of a mechanism to encourage consumers to select products incorporating low-carbon technology”

- Promotion of corporate disclosure and labeling of LCA (Life Cycle Assessment) information on each product.
- Establishment of a method to measure energy consumption data for the various use conditions.
- Promotion of attachment of IC tags to products and record of CO2 emissions during manufacturing and distribution processes on IC tags.



Policy instruments by the Government

(Continued)

Finance:

- Promotion of carbon offset activities
- Enhancement of a finance method to promote businesses that contribute to the creation of a low-carbon society.
- Promotion of the wider use of technology for highly effective end-use of energy through the provision of environmental ODAs.

“Hard”-infrastructure

Urban areas:

“Comprehensive strategy for revitalizing regions toward more efficient and concentrated land use”

- Mandatory inclusion of low-carbon plans in regional development master plans.
- Urban development where public transportation facilities (stations and stops) play a role as the nucleus of the development.
- Creation of safe downtown areas where people can walk without fear (transit malls, road pricing, traffic control).
- Regulation on the development of large suburban shopping malls.

Transportation:

“Development of low-carbon transportation network that matches the size of the city”

- Development of public transportation such as railway and LRT in the urban area
- Promotion of public transportation use in low density areas by introducing reservation system
- Development of walkway and bicycle path

Building:

- Promotion of construction of energy-independent, ultra-long-life houses and buildings (200 years houses)

Energy:

- Wider capacity for using electric sources with flexible supply of power volume through coordination among different supply sources and lines
- Increasing use of efficient heat energy by improving the urban-scale heat transfer infrastructure

Natural capitals

Natural environment, biodiversity:

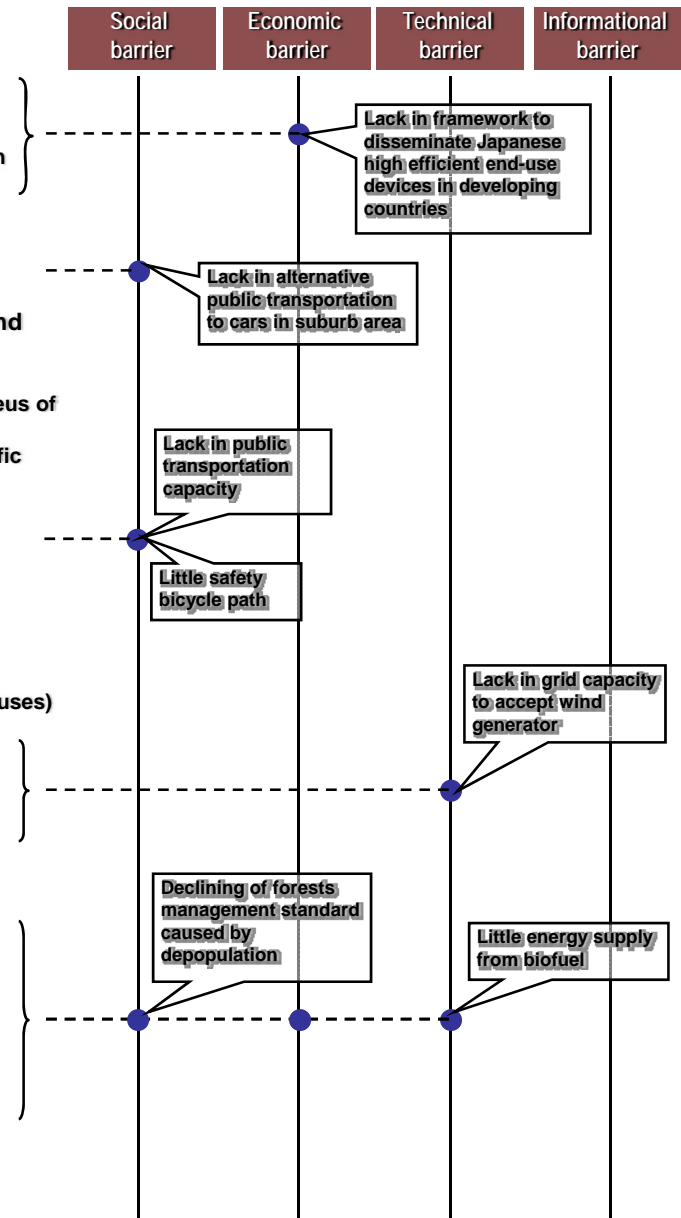
- Appropriate conservation of important area in terms of natural environment conservation
- Regeneration of lost natural environment
- networking between precious eco-systems

Agricultural and forest land:

- Comprehensive strategy for biomass resources (foodstuffs, lumber, energy, ecosystem services, etc.)
- Breed improving to adapt climate change

*Words balloon indicates examples of current barriers

*Words balloon indicates examples of current barriers



4. Sharing experiences & ideas among countries and International cooperation

- Our strong will to be a Leading environmental nation : Japan -

Achievement of high economic growth with highly limited available natural resources

In the second half of the 20th century, Japan achieved very high economic growth. Japan has been poorly endowed with natural resources, such as energy and minerals, and has a large population living in a small area. Thus, Japan did not have favorable economic conditions. In addition, Japan faced serious economic and social problems, such as severe pollution and a surge in energy prices due to the “oil shock.” However, Japan managed to overcome these problems through the development of energy conservation and pollution prevention technologies and the adoption of stricter regulations.

Frontier of Emerging Issues: Japan

Japan achieved strong economic growth, coping with serious economic and social problems. However, currently Japan faces new issues such as an aging society with small child population, disposal of household and industrial wastes, and the “heat island” phenomenon that other countries will also have to respond to sooner or later. Regarding global warming, the Japanese society has created various factors that resulted in “high-carbon” society. This is because the Japanese people had focused on more convenient lives and higher economic efficiency.

- Urban sprawl
- Development of traffic and cargo transportation system that relied heavily on cars and trucks.
- Town planning and housing zoning that neglected climate conditions; wide use of air conditioners
- Reduction in the number of people who take care of forests as a result of under population of the rural areas and the declining agriculture, forestry and fishery industries.

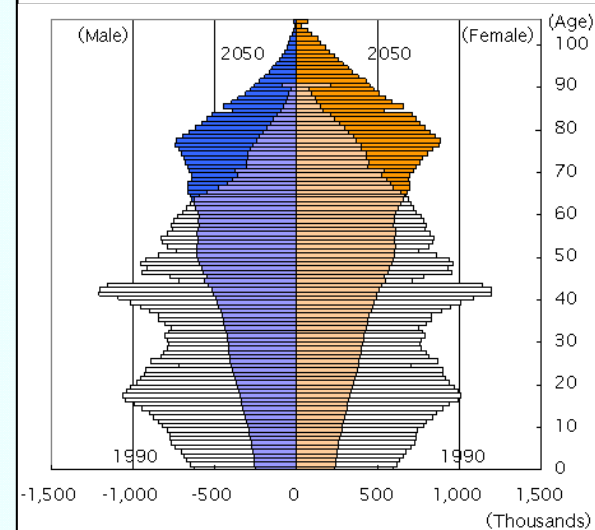
Identification of Japan's strengths and sharing of the “Japan Model” that capitalizes on these strengths

- Nature-views based on respect for coexistence with nature
- World's highest-level environmental and energy technologies, one of the essential requirements for Japan's social and economic growth
- Knowledge and experience that the Japanese acquired from their success in responding to serious pollutions

These are Japan's precious assets in which the Japanese people can take pride. By applying these assets to the efforts to significantly reduce greenhouse gas emissions, and by using them as a driver for the country's economic growth and the revitalization of each region, Japan will create a low-carbon society and share these experiences with Asian and other countries as the “Japan Model.”

Socioeconomic data of Japan

- Land area: 60th in the world
- Population: 10th of the world
- GDP: 2nd of the world
- Energy self sufficiency = 4%
- Food self sufficiency = 39%
- Wood self sufficiency = 20%
- Number of automobiles: 2nd of the world



Japan's population pyramid

Source: Ministry of Internal Affairs and Communications,
National Institute of Population and Social Security Research

- Japanese possible contributions, toward broader international cooperations -

1) Sharing the “Japan Model” with developing countries

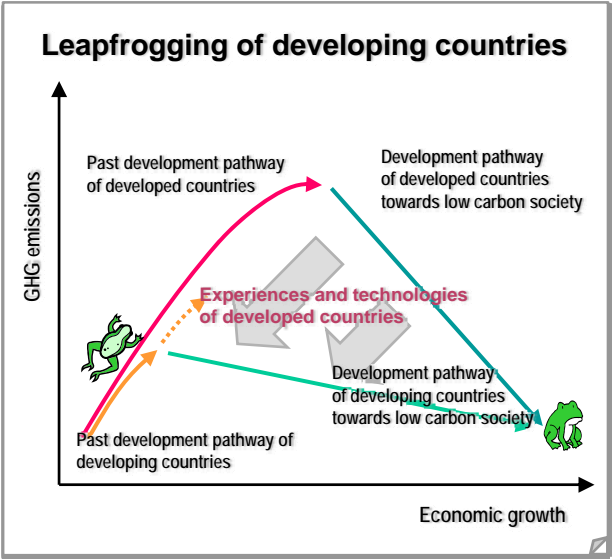
- For developing countries in Asia and other regions, it would be beneficial to share Japan’s experiences in the manner that would be suitable for each countries’ circumstance, as the “Japan Model” for solving pollution and energy problems, as well as creating an efficient society.
- Although Japan has developed high carbon society in the process of economic growth, developing countries can skip the process and create low carbon society directly by using Japanese experiences and technologies.
- There are many countermeasures on climate change that has co-benefit effects such as mitigation of air pollution or improvement of quality of life (QOL).
 <Japan’s unique traditions and experiences: “mottainai” spirit (too precious to waste), environmental and energy technology, transfer of the experience, systems, and know-how for solving pollution problems (enforcement of laws, capacity building on monitoring, systems to promote the creation of a low-carbon society, national and local government’s action plan/promotion plan toward a low-carbon society), energy-saving products and technology, improvement and wider use of public transportation in the urban areas.

2) Establishment of information center for a Low-Carbon Society and Promotion of international joint research activities and human development

- Japan will establish a center that collects, analyzes and provides updated information (technology, action, systems, people, customs, etc.) for the creation of a low-carbon society and coordinate joint international research activities.
- In making these efforts, it is important to fully cooperate with existing domestic and international research institutes, universities and private organizations for international cooperation located in Japan and to establish a network of these organizations.
- Capitalizing on the opportunity of hosting the Hokkaido Toyako G8 Summit, it would be possible to promote joint international research activities, for example, on measures that people should take as moving toward the creation of a Low-Carbon Society based on the experience of cooperation between Japan and the UK(Japan Low-Carbon Society Scenarios toward 2050” for numerical scenarios.<http://2050.nies.go.jp/index.html>)

3) Proposal to strengthen global-level incentives toward a Low-Carbon Society

- Formulation of rules on carbon pricing system, aiming to make people recognize carbon emissions as costs (provision of incentives and refund to developing countries)
- Promotion of countermeasures on international transportation through international cooperation activities
- Promotion of “green procurement”, “green contracts” and “environmental reports (CSR reports)” across the world, as well as the facilitation of product and service development that contribute to a Low-Carbon Society.
- Promotion of approaches to manage and maintain forests through international cooperation



Co-benefit approach	
Countermeasures on climate change	Economic and social development
Widespread use of energy independent houses	Increase in electrification ratio Increase in energy self sufficiency
Efficient production process	
Diffusion of motor driven vehicles	Mitigation of air pollution
Car-free society	
Development of intelligent transportation system	Traffic accidents reduction
local production for local consumption	
Practice of eco lifestyle (Mottainai spirit)	Prevention of rural community disruption
	Reduction in water consumption
	Reduction in waste